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PODIATRISTS

THE OFFICIAL PUBLICATION OF THE PROFESSION

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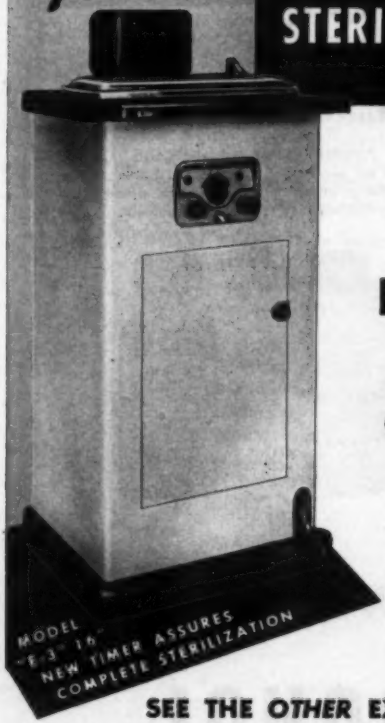

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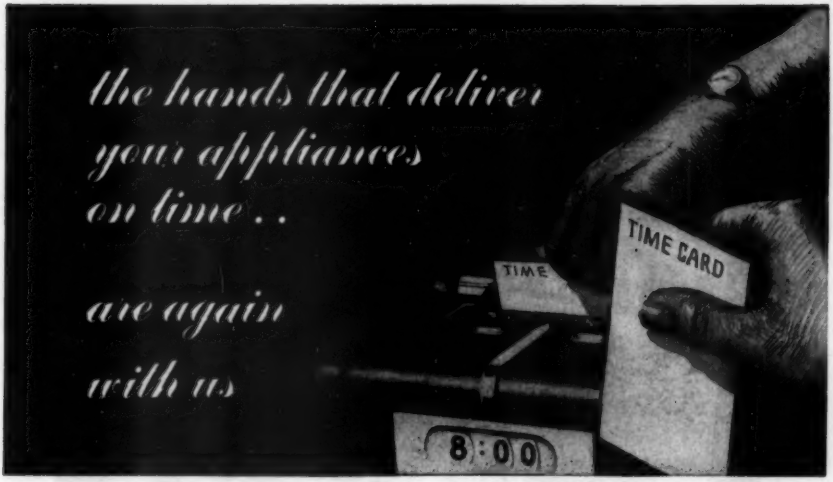

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VOLUME 37 AUGUST, 1947 NUMBER 8

CRYOTHERAPY FOR VERRUCAE

LEO N. LISS, D.S.C.
San Francisco, Cal.

Cryotherapy, as the term implies, is the use of cold for treatment. It is being brought to the attention of chiropodists and recently a new apparatus has been introduced which provides a method for using solidified carbon dioxide or "dry ice." This new apparatus is the subject of this paper.

Introduction

In 1907 Wm. Allen Pusey[1] introduced the use of solidified carbon dioxide, now obtainable as "dry ice." Sutton and Sutton[2] state that the degree of freezing depends on the duration and pressure of application and the therapeutic effect is greatly augmented by preliminary roentgenization. Alderson[3] summarized the clinical effects of refrigerants upon the skin as superficial necrosis proportionate to the depth and duration of the freezing; vasodilatation and dependent upon this, the dissipation of infiltration; improvement of skin tone and vessels; rapid local anesthetic effect and anti-pruritic effect.

Therapy with carbon dioxide snow is safe, efficient and simple for correcting skin lesions, especially those of the type encountered in chiropody. When originally introduced for therapeutic use, it was only possible to procure the carbon dioxide in blocks from a drug store or manufacture it by means of cumbersome apparatus in the office. Then it was necessary to carve the blocks into suitable sized crayons, which was a tedious procedure and it was almost impossible to make a crayon of suitable size. Some collected the snow formed by released carbon dioxide gas in copper tubes, wooden blocks or a chamois bag in order to utilize it for therapeutic purposes. These methods were not only wasteful but inexact.[4]

Recently, a small, portable apparatus has been provided which can be used in the office or carried in a medical bag for home treatment. This apparatus makes use of a small expansion chamber in which snow is formed by the escape of carbon dioxide gas from a small cartridge. The amount necessary to treat several small lesions can be obtained from one cartridge. If more snow is needed the chamber will hold the snow pro-

duced from two or three cartridges. A set of plastic crayons of various sizes, with a central pestle, is provided to form the snow into a compact mass. These insure against a change in size of the active tip even with the longest treatment, protect the operator's fingers, and eliminate the possibility of small chips coming off and injuring adjacent tissues. [5 6]

Action of Carbon Dioxide Snow

As the temperature of carbon dioxide snow is minus seventy degrees Centigrade, it can readily be appreciated that most of its action depends on quick freezing of the part. The factors of time and the amount of pressure used are of paramount importance. The first action of this type of treatment is one of cell injury, with the abnormal cells being destroyed rapidly. As the time and pressure increase, there is a thrombosis of the blood vessel walls and an inflammatory exudation of lymph and phagocytes. The sensation of pain, which feels like a burn, comes on within a few seconds and lasts from a few minutes to a few hours, depending on the severity of the treatment and the site treated. After a few hours a vesicle or bulla forms which usually ruptures in two or three days, leaving a serous crust that is easily removed in from two to fourteen days. For this reason, treatments should not be repeated more than once every two to four weeks.

The scarring which remains after a deep treatment, as a rule, is of a smooth, pliable, cosmetically good type and rarely becomes keloidal. For this reason, carbon dioxide snow therapy is often safer to use than other more destructive methods.

Mode of Application

Because of the importance of the time element, a watch with a visible second hand should always be used. The amount of pressure can quickly be learned by experience and is roughly classified as heavy, medium and light. Before applying the snow, it is best to remove all old crusts, scaling and tylomata. Remove any sebaceous material with a little ether, so that there will be more uniform penetration of the cold. It is better to select a crayon or applicator that is slightly smaller than the lesion to be treated, as freezing occurs beyond the selected circumference. Also, it is better to pick up a small lesion between the fingers, as this protects the underlying tissues. All common lesions such as verrucae, keratoses, angiomas, lymphangiomas and nevi may be treated with an average application of from ten to forty-five seconds duration.

The Apparatus[6]

Solidified carbon dioxide pencils are formed by piercing a cartridge of carbon dioxide gas and allowing the gas to flow into a cone shaped expansion chamber. Care must be taken to see that the apparatus is held in a vertical position to allow the carbon dioxide gas to flow down into the pencil chamber, because carbon dioxide is heavier than air. A patented tamping device, using the excess gas as a motivating force, tamps the snow as it is formed into a compact cone. The lower part of the apparatus may be unscrewed from the upper part to enable the operator to release the cone of snow from its mold. A series of applicators with diameters varying from 5/32 inch to ¾ inch is provided. The snow is forced into the applicators at the tip of the sleeve and is compressed into a hard pencil by means of a plunger. This is specially beveled so that the pencil formed will not drop out of the sleeve but must be pressed

out gently. The operator is then able to regulate the speed of renewal of the snow at the active tip and adjust the pressure necessary for refrigeration.

Case Histories[7]

The Kidde Company provided me with one of their kits for use in experimental work in the clinics of the California College of Chiropody, San Francisco. We have used the apparatus for a rather brief period and we will review a few of the typical cases where it was employed. The information provided is from the patients' records at the college.

Case Number 1:

Miss A. G., young, white, American female, presented herself at the clinic on January 9, 1947. Examination disclosed that there was a small, single verruca about 4mm. to 5mm. in diameter under the head of the fifth metatarsal on the left foot. The small crayon of CO_2 was applied with heavy pressure for 45 seconds. No dressing was used. The patient returned three weeks later—on January 30, 1947—and stated that she had no pain after the treatment or since. Complete sclerosis of the verruca had taken place. The necrotic plug was enucleated to disclose normal tissue underlying the area. The patient returned on February 20, 1947, at which time she had no pain or sign of the growth. The affected area was replaced with healthy normal tissue.

Case Number 2:

Miss L. T., 16 years old, white American female, student, presented herself at the clinic on March 3, 1947, complaining of pain in the region of a growth on her right heel. Diagnostic examination elicited the following:

Subjective Symptoms: Duration about three months—started as a small spot that gradually became larger and then a second one developed. She said, "It felt like a thorn." The only previous attempt at treatment was that administered at home. General health was good. She remembered having only measles and mumps, but no other childhood diseases.

Objective Symptoms: Posture and gait normal, except for a mild degree of left ankle valgus with slight pronation. There was a slight varicosity in the popliteal space of the left leg. Muscle tone was good. Skin temperature and color were normal. No Helbing's sign was found. Reflexes were normal.

Diagnosis: Two verrucae on the lateral plantar surface of the right heel. Mild weakfoot—heel rotation and pronation.

Recommended Treatment: Proper fitting shoes, medial heel wedges, CO_2 therapy for verrucae.

Treatment Record:

March 3, 1947—The excess tyloma from the verrucae area was removed, a felt pad applied and the patient instructed to return for CO_2 treatment.

March 6, 1947—CO_2 was used on the largest of the two verrucae and trichloracetic acid on the lower smaller one under the direction of one of the regular clinicians.

March 14, 1947—The patient returned and the verrucae were still in evidence. Another clinician used CO_2 for forty-five seconds on each verrucae. No record of pressure.

March 20, 1947—The verrucae were still in evidence and I applied the CO_2 this time for thirty seconds on each with heavy pressure.

April 10, 1947—Three weeks later when the patient appeared the larger verruca had disappeared but the smaller one persisted so the previous treatment of CO_2 for thirty seconds with heavy pressure was repeated.

April 24, 1947—When the patient returned two weeks later there was still some slight evidence of the lower, smaller verruca present. It was touched up with $AgNo_3$ 50% and the patient was instructed to return in a week. She failed to report and we surmise that the lesion disappeared.

Case Number 3:

Mr. S. L., a 30 year-old, white, American, student, presented himself to me at the clinic on April 3, 1947, with a single verruca about 2-3mm, in diameter. It was located in the area of the first metatarsophalangeal articulation plantar surface of the left foot. The lesion had been present for quite some time and various students and clinicians had tried several modes of therapy to no avail. CO_2 was applied for sixty seconds with heavy pressure. Two weeks later the foot was examined and there was no further evidence of the lesion. The patient had suffered no discomfort from the treatment.

Case Number 4:

Miss R. S., 17-year-old white, American, high school girl, presented herself at the clinic on April 8, 1947, complaining of "pain under the left foot," both with and without weight bearing.

Subjective Symptoms: Duration three to four months. Onset gradual. Patient had no idea as to cause. Previous treatment was use of corn file and corn pads with no help. General health good.

Objective Symptoms: Posture, gait and muscle tone were normal. Skin was cold and moist. Foot structure and reflexes were reported as normal. There was a verruca on each foot, that on the right foot being at the head of the second metatarsal plantar surface and the one on the left foot being on the planar surface between the second and third metatarsal heads.

Recommended Treatment: CO_2 therapy.

Treatment Record:

April 8, 1947—Examination and diagnosis. Area padded and the patient instructed to return for CO_2 therapy.

April 10, 1947—CO_2 was applied to verruca of right foot for thirty seconds and to the one on the left foot for sixty seconds with heavy pressure.

April 24, 1947—When patient returned two weeks later the verrucae were completely eradicated. The patient reported that following the treatment there was intermittent burning and throbbing through the night which served as an excuse to remain home from school the next day. The tops of the dried bullae were removed and disclosed normal tissue in the areas. The patient was asked to return in a week for a further check which she did on May 1, 1947. The area appeared filled in with normal tissue and there was no pain or other reaction.

Summary

The Kidde Dry Ice Apparatus offers a safe, convenient and practical form of therapy for the treatment of verrucae. It is especially useful in cases where there are no other complicating factors. There is evidently very little pain, discomfort or inconvenience after treatment with CO_2. Dressings are not essential. The simplicity of the apparatus and its mysterious effect should make it particularly attractive for the treatment of lesions on young children.

Conclusion

Cryotherapy as employed in the cases presented has been used very successfully in the treatment of uncomplicated verrucae. We believe it has definite value in such cases. We also feel that further experimental use of the "dry ice apparatus" on other types of skin lesions encountered by the chiropodist will likewise prove advantageous. Our clinical research in this field will be continued at the California College of Chiropody and we trust others will engage in similar projects.

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209 Post Street

MORE ATTENTION TO CHILDREN'S FEET IS NEEDED

ROSEMARY BECKER, B.A., D.S.C.
Chicago, Ill.

As LEADERS of tomorrow, today's children are the most important people in the world. If proper guidance and direction is offered at the formative ages, both they and the world they will be living in will be the better for it. The educators are becoming more and more conscious of the mental development of the child. Now, parents and teachers are working towards the development of a reasoning, responsible adult from a dependent, reflective child. Attention is given the growth of the mind of the child, of his general physical well-being. A child is growing, but all the average parents or his advisors do is buy bigger shirts and pants. What about children's feet?

Fifty percent of the general physical fatigue in adults, 75% of all the deformities in adult feet are due to neglect during the formative growing years of childhood and adolescence. There is no need of a baby's toes curling under. There is absolutely no reason for calluses on a child's foot. There is certainly no excuse for a pigeon-toe or a pronated gait. The walking foot just does not have enough room to function correctly.

Calluses, corns, and gait problems are the beginning of all the woes and troubles with which a child is going to have to contend, if proper supervision is not instigated at the fitting of the first shoe. It is the duty and obligation of every practicing chiropodist to advise and prescribe orthopedic prophylaxis, and so coordinate our profession with the endeavors of parents, teachers and pediatricians who are working towards the development of a happier and healthier coming generation.

3844 N. Broadway

SOME SYSTEMIC EFFECTS OF WEAKFOOT

DR. HARRY STURTZ
Floral Park, L. I., N. Y.

PART ONE

Introduction

THE INTENT of this paper is to supply in schematic form, with regard to weakfoot, a desideratum hitherto unsupplied in any of the texts of our profession; namely, a consideration of the effects of weakfoot upon the entire body structure. Literature abounds with the condition weakfoot *per se*, and there also is numerous mention of foot and leg symptoms of systemic origin. However, from an intensive perusal of the literature, there seems to be but sparse reference to systemic effects of weakfoot.

If one will recognize that essentially weakfoot is a "disease" of the locomotor system, and that normal locomotion entails the use of the entire musculo-osseous system, it seems to follow that an impairment of the locomotor system will adversely affect the muscolo-osseous system.

From the author's observations, some of the conditions toward which weakfoot seems to predispose are rheumatoid arthritis, osteoarthritis, visceroptisis, and physiological scoliosis; and in the process of assembling data for this paper, the author has had occasion to consult with several students of the aforementioned conditions. He was very much surprised to be informed, as you will, that such an approach is not entirely original —that for years, successful specialists in the arthridities routinely have had their patients consult with podiatrists for local foot therapy which was given concurrently with the physician's systemic therapy.

This paper is an approach to the subject. Further research is indicated. The systemic effects of weakfoot discussed in this paper are conditions which are met with in everyday medical practice, and which, in order to be intelligently handled, require medico-podiatrical cooperation. The author wishes to acknowledge the original approach to this subject by members of the medical profession specializing in the arthridities.

Weakfoot

The term weakfoot is applied to a foot that looks like a healthy and normal foot when not bearing weight, but which when weight is placed upon it, flattens to a greater or lesser extent and an angulation between the fore and rearfoot occurs in which the forefoot points outward. When relieved of weight, the foot again assumes its normal attitude.

As soon as the body weight is brought to bear on the weakfoot, the anterior part of the oscalcis sinks down. The anterior part of the astragalus has to follow this movement since this bone rests upon the former. The result is a lengthening and flattening of the foot through the midtarsal joint. This is checked when the anterior part of the oscalcis cannot come down any further, i. e., when the outer side of the longitudinal arch has completely flattened. Next the head of the astragalus is displaced inwardly by the rotation of this bone on its vertical axis. The tibia, resting on the astragalus, grips it together with the fibula in mortise-fashion. Thus these two bones must follow the inward rotation of the astragalus, as likewise must the femur which is connected to the tibia in the knee joint. The result is an inward rotation of the knee and hip.

Unilateral Weakfoot—Under weight bearing the weakfoot rolls over to its inner side, the distance between the tip of the internal malleolus and

the ground is thereby decreased. The distance between the anterior superior spine of the illium and the ground on the affected side is shorter than the same measurement on the non-affected side. The anterior superior spine of the illium on the affected side is lowered or tilted on the affected side as a result of a collapse of the foot structure. This is designated as a direct change because the pelvis jointed to the femur which rests on the tibia, which in turn rests on the foot, is raised or lowered as its supporting structure is elevated or depressed.

The spinal column resting on the sacrum – a part of the pelvis – is tilted over to the affected side with the pelvis. The equilibrium of the entire body is thereby disturbed. To regain it, or to bring the center of gravity again over the middle line of the body, the upper part of the spine is bent over to the opposite side. The result is an "S" curve in the spine. This may be styled an accommodative change, since the spine is accommodating itself to the altered position of the pelvis when the latter is tilted to one side by the collapse of one foot. The extent of these changes in the pelvis and spine is, of course, dependent upon the degree of weakness in the foot, upon the type of foot affected as well as upon the duration of the condition.

Bilateral Weakfoot – In bilateral weakfoot the parts above the hips are affected in a different way. When both feet are equally weak, lowering of one side of the pelvis, as in unilateral weakfoot, does not take place, nor do we find a secondary scoliosis. Instead, through the inward rotation of the heads of the astragali and the consequent inward rotation of the knees and hips, the heads of the femurs rotate inwardly, causing a forward inclination of the pelvis with a lumbar lordosis. The chest becomes flattened and the subcostal angle narrowed, with the ribs low in front. There is inadequate support of the shoulders so that they droop forward and downward and the scapulae are rotated outward. With the assumption of such a position, the weight of the body is thrown excessively upon the innerside of the legs so that the knees are often hyperextended and the feet become further pronated.

With the sagging of the chest and the forward droop of the head, the diaphragm assumes a position lower than normal and there is a marked decrease in its excursion. The chest becomes markedly flattened anteroposteriorly. The heart assumes a more vertical position and the aortic arch may be found at the fourth costal cartilage anteriorly. The abdomen shows a depression below the costal border with a prominence usually below the umbilicus. The liver and kidneys are often displaced downward with the relaxation of the anterior abdominal wall and results in the non-function of the normal anatomical supports such as the kidney pouches and the psoas shelf.

Thus we find that a unilateral weakfoot results in an asymmetry, and causes a physiological or accommodative scoliosis, while a bilateral weakfoot has a tendency to cause a physiological lordosis of the pelvis and abdominal region with a compensating flattening of the chest. These changes are physiological skeletal compensations or accommodations – in contradistinction to pathological skeletal changes (due to tuberculosis, etc.).

EFFECTS OF PHYSIOLOGICAL SKELETAL COMPENSATIONS—DUE TO UNILATERAL WEAKFOOT

Scoliosis

The normal vertebral column is about 28 inches long in the male and 24 inches in the female; the intervertebral fibro-cartilages account for nearly one-fourth of its length. The vertebrae are joined together by the fibro-cartilages between the bodies and by the various ligaments that connect the body, laminae, and process of one vertebra with corresponding parts of its two immediate neighbors, so that the vertebrae make a strong column for the support of the trunk and neck and a pedestal for the head. The column of bodies is the chief axis of support.

The column is not straight. There are anteroposterior curves as well as lateral curves. The cervical curvature is convex forward, the thoracic curvature is concave forward, the lumbar curvature is convex forward and the sacro-coccygeal curvature is the original lower primary curve and is concave downward and forward. Besides these prime curvatures, the column of bodies is often slightly convex towards the right side on the thoracic region. That lateral curvature may be due to the greater muscularity and use of the right upper limb, for it is said to be convex towards the left in left-handed people; but much more probably it is due to the pressure that the upper part of the descending aorta exerts by its pulsations on the left side of the bodies of the middle four thoracic vertebrae, and in the rare cases in which the aorta is on the other side of those vertebrae the curve is convex toward the left. When the lateral curvature is well marked there are compensatory curves in the opposite direction, above and below it.

Physiological scoliosis due to a unilateral weakfoot may be functional or structural.

Functional scoliosis is a lateral curvature of the spine generally characterized by a deviation of the whole spine, accompanied by rotation of the vertebrae toward the concavity of the lateral curve, and the spine presents an appearance depending upon the side of the weakfoot. Functional scoliosis is present in the early stages of the deformity and is maintained by the active muscular efforts made unconsciously by the individual in order to overcome a slight sense of imbalance.

Structural Scoliosis — as the condition progresses and becomes chronic structural changes set in, bony, ligamentous or both. At that time the musculature "gives up the struggle," so to speak, and allows the spine to assume a position which is mechanically more natural, namely that of rotation toward the convexity of the lateral curvature.

(The direction of rotation of vertebrae is defined with reference to the side toward which the body of the vertebra turns.)

An understanding of scoliosis, whether functional or structural, requires an analysis of the mechanics of the spine and thorax under conditions of twisting and lateral flexion of the trunk in normal individuals, since the types of scoliosis under consideration originate from an asymmetric extremity, hence from asymmetric positions of the normal spine. All efforts to understand spinal anomalies by the application of simple laws of mechanics have failed due to the complexity of the bony, muscular and ligamentous arrangements especially in the thoracic region.

Whenever the trunk is bent sideward the individual vertebra must of

necessity rotate. The converse of this statement is likewise true: that rotation of the spine inevitably involves lateral flexion. In the lumbar region the amount of rotation possible without deformity of the vertebrae depends largely upon the tightness of the capsular ligaments of the intervertebral articulations since the intervertebral disks are relatively thick. The considerable amount of lumbar rotation which exists in structural scoliosis involving the lower part of the spine is due to a torsion deformity of the bodies of the vertebrae as well as the "play" made possible in the intervertebral articulations by slack capsular ligaments. The sagittal plane of the articular facets of the intervertebral joints tends to lock the normal lumbar spine against rotation. Therefore, the marked lumbar rotation in structural scoliosis can occur only by torsion of the individual vertebrae, either the twisting of the upper surface of the vertebral body on the lower part, or torsion between the body and the pedicle.

Rotation of the thoracic spine is generally more noticeable than that of the lumbar region, due to the marked unilateral prominence of the angles of the ribs. In structural scoliosis the prominence on the back will be found on the convex side of the lateral curvature, while in functional scoliosis the angles of the ribs stand out prominently on the concave side of the curvature.

Since the costovertebral ligaments are short and strong, rotation of the vertebral bodies toward the right necessarily displaces backward the head, neck, tubercle and angle of each rib, while the tension thereby exerted on the costal cartilages causes a distortion of the thorax anteriorly. Frequently this tension is sufficient to draw the sternum sideward, contributing to the asymmetry apparent on inspection of the anterior aspect of the thorax.

Among the first of the body changes which take place when functional scoliosis becomes structural is a flattening of the thorax on the side of the convexity of the lateral curve. This is partly due to the adaptation of the ligaments and costal cartilages to the lateral flexion of the spine, but also to changes in shape and inclination of the ribs, especially in the mid-region of the thorax. These transformations have been gradually induced by the pressure of the superficial soft tissues, the muscles, skin, etc., on the side of the thorax corresponding to the convexity of the lateral curvature. If such a position should become habitual, even though the sideward flexion be slight, this pressure on the convex side will have a deforming effect upon the thorax. At this stage of scoliosis there may exist no external indications of a curvature of the spine, though an x-ray examination would undoubtedly show some lateral deviation and rotation of the vertebrae of the mid-thoracic region. Later stages usually involve, first, a total curvature of the spine and later, an S-curvature resulting from the natural tendency of the individual to compensate.

As the deformity progresses bony changes occur. Constant pressure of the rib backward against the transverse process in time causes the latter to be deflected backward, producing an increase in the length of the pedicle. Frequently the vertebral body twists in itself, and sometimes the spinous process deviates from the mid-line because of unequal muscular and ligamentous tension on the two sides of the vertebra. When such is the case, an estimate of the severity of the deformity based upon palpation and marking of the skin over the spinous process is very un-

reliable, examination by means of x-ray being the only method of determining the true extent of the deformity. In most cases of structural scoliosis, the amount of deformity shown by x-ray is much greater than would be suspected from inspection of the body contours and bony landmarks.

Therefore, in unilateral weakfoot, during the early stages in the development of lateral curvature of the spine, a single curve exists, extending more or less throughout the length of the lumbar and thoracic spine. Such a total curvature may become static, given favorable conditions of health and muscular vigor, but in most cases the attendant loss of perfect balance, subconsciously felt by the individual, causes him to make muscular adjustments which result in the establishment of compensatory curves.

Scoliosis is a condition of extreme gravity, generally progressive in nature and involving many aspects of the general health.

Part Two will follow in a future issue

231 Tulip Ave.

SURGERY AND WOUND REPAIR

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THE LATE Dr. E. W. Cordingley stated that "If we forget the medical and surgical side of treatment, which gradually seems to be cast aside for other modalities, we shall have to worry about the osteopath, chiropractor, pedopractor and pedojerker, who seek to invade the Chiropody field. It would be well to revaluate the possibilities we have in those medical and surgical departments in which we are not so subject to imitation."

We have a unique field and yet one sorely neglected in the realm of surgery. Ten years with Chiropody has indelibly fixed this conviction rather than shaken it. We who apply it are as sure of it as our many successful colleagues who specialize in orthopedics or mechanical and physical methods of therapy.

An admitted interest in and desire for surgery is so often expressed, but likewise is the admitted fear and lack of confidence. This may be traceable to early training or more likely neglect of it. It may be that the subject of tissue and its repair has never been approached properly or sufficiently to instill in us a firm conviction. With this in mind this paper is offered—a review to be sure, but most of us learn by repetition.

It is sufficient to say success is dependent upon healing. I shall try to describe the manner in which healing takes place and a few of the artificial methods used to facilitate it. Only a few tissues, to be taken up later, reproduce elements which in all essential characteristics are similar to those destroyed by trauma. For the sake of this paper, surgery is "sterile trauma." Bone cells reproduce bone cells, epithelial cells produce epithelial cells; however, the cells of highly organized tissues, such as nerve centers, the liver, muscle fibre and the like, when once destroyed are not reproduced and may be regarded as lost. Repair in these latter instances takes place by the production of fibrous tissue which in most instances does not interfere materially with the function of the part damaged. A considerable portion of a highly functioning organ may be destroyed and repair with scar tissue take place. Yet sufficient cellular elements remain intact so that no perceptible lessening

of function occurs. This outcome is dependent, of necessity, upon the extent of the injury and the excess of cellular elements with which each organ is endowed.

We now describe wounds with respect to peculiar characteristics, whether they are the result of cutting or tearing and to show that their healing properties vary. However, the process of repair is similar in all instances, the variance of the clinical picture being due to the degree of cellular activity. Indeed, the same may be said, not only regardless of the character of the injury but also regardless of whether the healing be by first intention or be complicated by infection.

Clinically wounds, whose surfaces lie in apposition, heal by primary or first intention. Wounds whose surfaces are separated, wounds that are infected or wounds involving loss of substance heal by secondary union.

In some instances secondary healing may be accelerated by apposing the wound surfaces. This is at times called healing by third intention, an unnecessary addition to the terminology.

Primary union occurs in about seven days. Between the closely apposed surfaces a layer of fibrin is deposited containing lymph, debris of blood cells and serum (called wound secretion). This is the first step in primary union.

The wound secretion acts as a cement holding the surfaces of the wound together. It does not enter the healing process but does maintain apposition. It overflows upon the surface forming a scab that eventually separates to leave a greater or lesser scar. Scar tissue always forms even though microscopic in dimensions. It is the inevitable sequel to all wounds but may be indiscernable to the naked eye by being covered with horny epithelium or hidden in skin folds.

Regeneration begins simultaneously with the appearance of wound secretion. Responding to the irritation of trauma the surrounding capillaries dilate and with their associated vessels become engorged with blood. This is known as regenerative hyperemia. At the same time polynuclear leucocytes make their appearance along the vessel walls. These leucocytes, phagocytes, absorb the destroyed cells by the production of ferments which are capable of dissolving albumin. Likewise, they produce a substance destructive to pathogenic bacteria. This latter fact is important for despite precautions, antiseptic or otherwise these bacterium are present in all wounds. Also, leucocytes through the motility of their protoplasm are capable of taking up minute particles of debris and necrotic tissue. Many of these leucocytes are killed in the line of duty but are replaced by others.

This process of phagocytosis is further supplemented by macrocytes which appear in the vessels adjacent to the wound, taking up fat globules, blood pigment, attenuated and destroyed leucocytes with which they enter the lymph stream and thence travel to the lymph nodes.

Endothelial and connective tissue cells make their appearance at this time. Then appear large irregularly formed cells; these are uni, bi, or polynuclear. The latter are known as giant cells. These cells called fibroblasts originate from connective tissue. They invade and supplant the fibrin layer to which earlier reference was made.

The wound is now held together by fibroblasts, leucocytes, lymphocytes and plasma cells together with proliferating blood vessels all known as embryonic tissue. New blood vessels are formed by the budding of

arched protoplasmic projections which arise from the walls of capillaries, coalesce and as a result of liquefaction through the centers become new conveyors of the circulating medium. When embryonic tissue is thus vascularized it becomes granulation tissue.

This process is accomplished in about seven days. At first the scar is red as a result of the many new blood vessels. Gradually connective tissue predominates and many of the vessels are obliterated causing the scar to pale. Later a great part of the connective tissue is absorbed and the remainder takes on the characteristics of elastic tissue. Hence, the change may be noted only with a microscope. After several years all pigment is absorbed and then a white surface is noted. The ultimate scar will be in proportion to the injury and the corresponding regenerative process.

Secondary union is characterized by the same phenomena and the same cellular changes as primary healing only on a more extensive scale. Clinically, secondary healing of a wound is differentiated from primary healing by the more abundant appearance in the former of the red granular tissue and the failure of primary union to occur because of the character of the trauma or because infection was present.

After two or three days these wounds are covered with blood debris and fibrinous exudate which soon undergoes superficial necrosis becoming fluid by the admixture of leucocytes and serum and is discharged. The discharges will vary from serum to pus depending upon the predominance of its constituents. Necrosis of the exudate and a serous discharge always accompany secondary union. The presence of sufficient leucocytes to render the discharge purulent denotes infection.

In from four days to a week small areas of granular masses appear in the wound. These are called granulations and consist of proliferated tissue cells. Each granulation receives a capillary loop and soon the entire wound is filled with granulation tissue in which the blood vessels continue to bud and coalesce. Through this process the fibrinous exudate and necrotic elements are entirely replaced.

Repair of gaping wounds may be accelerated by approximating healthy granulating surfaces. These will readily coalesce and the rest of the process is essentially that of primary union. To repeat, the process of healing, histologically, is the same. In this latter type we find the term "third intention" referred to previously.

While the second intention wound is being filled with healthy granulations the fluid discharge is cleansing and destroys the ever present microorganisms.

In the deeper layers the connective tissue fibres formed by the fibroblasts lie parallel to the surface of the wound. More superficially they arrange themselves perpendicularly, arising with the budding blood vessels.

Epidermitization begins when the granulations reach the surface of the skin. It develops by proliferation of the epithelial cells at the margins. It appears as a thin bluish white line gradually extending across the wound. At times it reaches down between the granulations forming the irregular papillae often seen on recently healed wounds. The small islands of epithelium frequently seen on the surface of granulating wounds proliferate from portions of hair follicles and sweat glands which have survived the original trauma. Cicatrization of the new skin and connective tissue continues, the fibres of the scar tissue shrink and

become more dense. This shrinkage may be responsible for deformity at times. Hence, the care in "laying your scar" when doing surgery. Scar tissue does not contain nerve fibres, elastic fibres or the granular elements of the skin. Occasionally, connective tissue instead of contracting continues to proliferate forming vascular protrusions called keloids.

Clinically, repair under a scab follows superficial abrasions and injuries of the skin, i.e., after removal of skin grafts where the entire thickness of the skin is not involved. This scab consists of dried sero-fibrinous exudate mixed with blood debris. Primary wounds have their narrow linear surfaces covered with this material and at all times the edges and often the entire surface of secondary wounds are encrusted with it. These wounds are soon epidermitized. The new epidermis proliferates from the edges of the wound and insular areas of the malpighian layer of the skin which has not been destroyed by the injury. Much the same process occurs under a thermal bleb.

When epidermitization progresses under the protection of a scab and the scab is forcibly removed there is a delay in the rate of repair.

Healthy granulations are hard and firm engorged with blood and do not readily degenerate. Unhealthy granulations are gray, sluggish, spongy and smooth. The etiology of unhealthy granulations may be constitutional or local. Exhausting diseases such as tuberculosis or lues make for sluggish repair of wounds as there is apparently a deficiency in cellular elements needed. The usual local cause is the presence of bacteria. The persistent recurrence of exuberant granulations should suggest a chronic process and is due to lavage of granulating surfaces with pernicious secretions. These wounds do not epidermitize because the exuberant projections mechanically interfere with epithelial growth and large numbers of the cells are destroyed by the wound secretions.

Repair of highly specialized organs also takes place by the formation of connective tissue. It is claimed, in some cases, that functioning cellular elements are regenerated after complete destruction, as for instance nerve tissue. If so, this occurs after the formation of the new connective tissue.

Cartilage and bone tissue does regenerate; the embryonic cells arise from the periosteum, bone marrow and perichondrium.

Union of serous surfaces in gastro-intestinal anastomoses takes place by a primary fibrinous cementing and is ultimately maintained by connective tissue which is essentially the same as scar tissue elsewhere.

Repair of injured and ligated vessels too take place by the formation of connective tissue being different from the above in that the budding of the blood vessels precedes the connective tissue. The new vessels are developed chiefly from the vaso vasorum and partly from the adjacent capillaries. Blood vessels whose intima has been injured obliterate by the formation of a clot which ultimately undergoes the same changes as healing wounds generally.

Granulation tissue dissolves, expels or encapsulates foreign bodies and replaces it with connective tissue. Catgut and the fibrin of hematoma are rendered fluid by the action of cellular ferments and are completely absorbed and these areas too filled in with connective tissue. Necrotic tissue such as sloughing fascia or tendon and particles of dead bone are attacked by a similar process. The offending material is surrounded by an active regenerative inflammation and frequently the sequestrum is expelled through the skin. Foreign bodies that cause only slight irrita-

tion and are accompanied by few or no bacteria may be entirely encapsulated and remain so. Virulent bacteria are at times encapsulated with a foreign body; years later trauma at the site of the old injury will show that local resistance was sufficient to prevent more extensive pathology.

Wounds caused by one or more of the aforementioned methods, other factors being favorable, can usually be depended upon to heal. The encouraging fact favorable to the surgeon is that nature strives to repair and hence is always his laboring ally. Respect the tissue with which you work. Likewise, respect the force which gave it origin, the same force that will ultimately give it repair. Play your role, as the intermediary, with care, study, diligent application and above all with complete asepsis. Your reward will be added favorable entries into your case records.

423 East 7th Street

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URGE NON-MEMBERS TO JOIN THE N. A. C.

BOW LEG AND KNOCK KNEE* GENU VALGUM-GENU VARUM

HERMAN R. TAX, B.S., Pod.D.
Long Island City, N. Y.

INFANTILE bow leg of marked degree is not commonly seen today. The bow leg due to metabolic disease is a rarity in this country because of the care that youngsters receive today to aid growth and preserve health. There are, however, several bow leg problems which we still see in practice.

1. *Infantile bow leg, mild:* There is a type of bow leg which is present in some infants before walking age is reached. This type of bow leg may be very apparent before walking. When the child begins to walk the coordinating pull of the antagonistic muscles exerting pressures on the bony structure of the legs rapidly straightens them. We have seen bowed legs improve completely in three months time merely by allowing the child to walk.

2. *There is a familial type of bow leg* which presents a problem. This type of leg is an inherited shape. There is a long very mild bowing which

*This article is an excerpt from "Podopediatrics, the Care of Children's Feet," a book to be published soon by the author.

extends from the hip to the ankle. These legs are usually associated with pronated feet. There is very little that can be done in the way of straightening these legs as they are normal in function and only a problem from the standpoint of aesthetics. Radical treatment is seldom warranted.

3. *The average case of infantile bow legs:* Requires very little treatment. The child should be getting a proper diet including vitamin D and exposure to sunshine. In most instances we advise simple passive exercise by the parent. Pressure is applied against the long bones of the leg to straighten it. Shoe modifications are usually unnecessary. However, where pronation exists, therapy for the pronation should be instituted. Overweight children should receive long arch padding where bow legs are present.

Knock knee of severe degree is as rare as bad bow legs in these times. At any rate we see only very mild forms of knock knee. The same care should be instituted in cases of knock knee as was discussed under bow leg. Passive exercise by the parent, attention to the pronated feet, which are usually present and arch padding in the shoe for pronation or overweight.

Contrary to most opinion walking develops bone structure and tends to prevent deformities. In our opinion early walking does not cause the bow leg or knock knee conditions. We have seen most cases of severe infantile bow leg corrected as soon as the child was able to walk. This of course does not refer to the bowing seen in various diseases of childhood. Where there is a deficiency of lime salts in the bones they will gradually bend under the child's weight. However, the great majority of infantile bow legs are not deficiency diseases so that this problem does not as a rule pertain.

Care should be taken to apply diapers properly on the infant since a very thick diaper between the legs may cause bowing.

Manipulation is very important in infantile bow leg and knock knee cases. One hand is placed against the upper border of the tibia and with the other at the lower inner border of the tibia the leg bones are forced straight and held a few seconds. Then relaxation is allowed and the exercise repeated. No pain should be incurred; reverse hands for knock knee.

Night braces may be used as well as day braces. For a mild case nine months to two years may be necessary. Braces are valueless if used after five years of age.

Past the age of six the quickest way to correct very severe bow legs is surgery (osteotomy). In our opinion very few cases are seen today that require surgical correction.

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R-LEDGER, THURSDAY, OCTOBER
Navy Reports Athlete's Foot Cure
WASHINGTON (AP)—A new treatment for "athlete's foot" and other fungus infections was announced yesterday by the research division of the Navy's Bureau of Medicine and Surgery.
Known as "undecylenic powder," the new preparation has as its active ingredients undecylenic acid (2 per cent.), a fatty acid found in sweat, and its zinc salt, zinc undecylenate (20 per cent.), which are fused in ordinary talc.
An ointment form of the new preparation used in more severe cases contains five per cent. undecylenic acid and 18 per cent. zinc undecylenate in a carbowax base with water, propylene glycol and triethanolamine.
The preparation was tested by Cmdr. Henry C. Shaw, Medical Corps, in a study involving more than 5,000 Navy men at Fort Pierce, Vero Beach and Melbourne, Fla. "Athlete's foot" developed in 26 per cent. of the trainees who used no prevention, and regular dusting with the new powder cut infections to four per cent.
Under the same conditions 15 per cent developed infection while using powder containing boric salicylic acids, long a standard preparation. Groin infections were cut from 10.3 per cent. to 0.7 per cent. by the new powder. The ointment cured about 90 per cent. of moderate and severe foot and groin infections in two or three weeks.
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*J. G. Hopkins, J. K. Fisher, A. B. Hillegas, R. B. Ledin, G. C. Rebell and Earl Camp: Jr. Of Invest. Derm. 7: 239-253, 1946.

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THE

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WASHINGTON, 10, D. C.

Address all communications intended for publication, matter relating to advertising, business or subscriptions to the Editor.

PRESIDENT'S MESSAGE

SEPTEMBER marks the beginning of the year during which it is my privilege to serve the National Association of Chiropodists as president. It is my desire to conduct this office with a sense of duty and distinction commensurate with the honor that such office entails. I am an idealist, and although there are those that may not agree with the ideals that I shall expound, I sincerely hope that they will at least meet the rest of us halfway. Whatever compromise shall issue therefrom will certainly be for the benefit of the majority. We are indeed fortunate to be living under the most democratic conditions in the world, under which system we are free to express ourselves – if there are those of you who have criticism, please bring it out into the open for complete and unbiased adjudication. If your criticism has virtue we may all benefit therefrom. I am of an open mind and I am sure that the majority of the leaders in this profession are too. There are no "cliques" directing the actions of this Association, unless you think that those who are carrying the load and doing the work compose such a group. Of course if you do want to dispense with such an attitude the best way to do so is to join the "clique" and help the rest of us do the job that we have before us. If any member has any suggestion to make for the betterment of this organization, or wishes to offer his services to help do so please communicate with me and I assure you just consideration will be given aside from just an acknowledgment. The one thing that we should all be interested in is the progress of our profession and all that we wish for can be accomplished if we unite the North with the South, the East with the West and meet in the middle for our common good.

Leo N. Liss, D. S. C.
President.

NOTICE—N. A. C. OFFICE WILL BE CLOSED FROM AUGUST 16th TO SEPTEMBER 27th

THE N.A.C. OFFICE will be closed from Aug. 16th to Sept. 27th in order to give the Executive Secretary and office staff an opportunity to take a vacation. Members are requested not to communicate with the Executive Secretary during the period between the dates announced. Replies to correspondence will be resumed on Oct. 1, 1947. Your cooperation will be appreciated.

WM. J. STICKEL,
Executive Secretary

REVISION OF MEDICAL DEPARTMENTS IN ARMY AND NAVY

ON JULY 26, 1947, the Senate passed in an amended form H. R. 3215, legislation that provides for the revision of the Medical Departments of the Army and Navy.

By the terms of the bill, a Medical Service Corps would be established in the Army with a Reserve component, composed of pharmacists, sanitary engineers, optometrists, psychologists, bacteriologists, business administrators, and similar skills, and would consist of three sections: Pharmacy, Supply and Administration; a Medical Sciences Section, and an Optometry Section, plus other sections thought necessary by the Secretary of War. Heading the Corps would be a colonel-chief, with assistant chiefs as consultants to the Surgeon General.

The present Pharmacy and Medical Administrative Corps would be integrated into the medical Service Corps and their personnel would be transferred to that Corps.

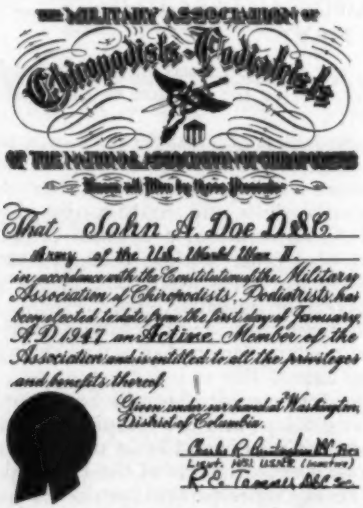
The Navy Medical Department would be revised by establishing a Navy Medical Service Corps and the Hospital Corps of the Navy. Appointees in the Service Corps would be in the grade of ensign from commissioned warrant or warrant officers of the Hospital Corps of the Regular Navy or from among other persons considered qualified for such appointment. The latter appointees would have to be graduates of recognized colleges conferring degrees in sciences allied to medicine. Persons with the doctorate degree would be appointed in the grade of lieutenant (jg). Personnel of the Hospital Corps would be appointed from among first-class petty officers or chief petty officers.

UTILIZING HUMAN TALENT

WITHIN the practical limitations inherent in any undertaking of such tremendous scope, American manpower was selected and trained in the armed forces solely in the interests of the national welfare. Whether a man received a certain course of training or a particular duty assignment depended on his abilities and the needs of the services, though in many cases his preferences were taken into account if it was practicable to do so. In peacetime, the requirements for training citizens in the interests of the national welfare are, by comparison, ill-defined. Freedom of the individual to choose his own activities and to map out a career for him-

self rather than the compulsion demanded by the exigencies of national defense becomes a paramount consideration. Nevertheless, the selection and classification of men and women in the armed forces primarily on the basis of their merit and of the national welfare suggests that in a society becoming more democratic all the time, some systematic, nation-wide procedure be developed for identifying men and women of exceptional and specialized talent and for providing them with the opportunity of appropriate training regardless of their financial resources or those of the community in which they happen to reside.—*Frederick B. Davis, Utilizing Human Talent, Washington, D. C.: American Council on Education, 1947, pp. 34-35.*

MILITARY ASSOCIATION OF CHIROPODISTS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Army of the U.S. World War II
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CALL FOR MANUSCRIPTS

MEMBERS ARE REQUESTED to submit manuscripts for publication in future issues of THE JOURNAL. Suggested subjects which will be of interest are: Case Histories, Shoe Therapy, Professional Economics, Chiropody Education, Patients' Relations, Industrial Chiropody, Children's Foot Care, Office Management and Arrangement, Anesthesia, Dermatology, Physical Therapy, Neurovascular Disturbances, Vocational Guidance, Surgery, Hydrotherapy, Public Education, Disorders of the Nails, Orthopedics, Pharmacology, History of Chiropody Surgery, etc.

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   It should be easy of application, so that the patient can use it as directed by the practitioner. It should not be "messy," so that the patient will not seek excuses to omit application.
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3. *Its use as a wet dressing is frequently indicated. If the toes are affected,* a thin layer of cotton, moist with the medication, must be left on, between, and under them on the morning application, to be held in place by the hose during the day.

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STATE AND LOCAL SOCIETIES ARE URGED TO CONDUCT INDUSTRIAL FOOT SURVEYS

A—The National Association of Chiropodists urges each state affiliated organization to create a "Committee on Industrial Foot Health." In connection with our program to provide professional foot care and consultation service to industry we have provided a form which is to be used in making local surveys of industrial personnel. These forms may be obtained from the Executive Secretary. They are provided (in pads of 50) at a cost of one dollar per 100 forms. Order them at least two months before they will be required.

B—The purposes of an industrial foot survey are:

1—To obtain information, data and statistics for use by the profession.

2—To provide factual information which will enable us to submit definite proposals to industrial management, employees' organizations, etc., regarding the need for chiropodical service among industrial personnel.

3—To serve as a means for educating employees on the importance of foot health and the prevention of foot disorders.

C—When planning an industrial foot survey contact management and health service officials of the firm. It will be well to conduct a preliminary educational program among the employees before beginning the survey, explaining the purposes of the survey. Contact officials of unions and employees' organizations concerning this phase of preparatory procedure.

D—Industrial foot health surveys planned or conducted should have the approval of the National Association of Chiropodists and application for such approval should be made to the Executive Secretary. A complete report of the survey must be sent to the Executive Secretary.

INFORMATION WANTED REGARDING CHILDREN'S FOOT HEALTH PROBLEMS

THE EXECUTIVE SECRETARY will appreciate receiving information relating to "children's foot health problems."

In recent months we have had a number of requests for data concerning the conducting of school children's examinations, pathology, statistics regarding incidence, age, sex, etc., prophylactic measures, methods and techniques of handling children and their foot problems, reports on school surveys and related information.

Due to our lack of material on this subject we have been unable to provide satisfactory information to members. If it is available, please send the reports, data, etc., to the Executive Secretary as soon as possible.

REQUEST FOR F. H. W. REPORTS

State-Local Foot Health Week Committees and individual members are urged to send in their reports to the Executive Secretary. Whenever possible send the entire page on which an F. H. W. item appears. Your cooperation will be appreciated.

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MEMBERS with hospital, institutional or industrial staff affiliation are requested to send the following information to the Executive Secretary:

a — Your name and address
b — Name and address of hospital, institution or industrial firm with which affiliated
c — Brief description of duties
d — Number of hours in attendance
e — Are you compensated for your services?

If you have already forwarded any of the above requested information, please do not send it again.

The Journal of the National Association of Chiropodists

3500 14th St., N.W., Washington 10, D. C.

ALL STATEMENTS and expressions are those of the writer over whose signature they appear and they are not to be construed as expressing the views of the National Association of Chiropodists unless such statements or opinions have been adopted by the Association.

Communications regarding manuscripts, news items, advertising, editorial and business matters should be addressed to the Editor.

Subscription is included in the annual membership dues of the National Association of Chiropodists. The subscription rate for non-members is $5.00 a year in advance. Remittance should be made payable to the National Association of Chiropodists.

Notice of change in address should be received six weeks before the change is to become effective. Old and new addresses should be given.

Articles are accepted with the understanding that they are submitted solely to the Journal.

Manuscripts must be typewritten, double spaced, and an original copy must be submitted. Reference should give name and initials of author, volume, page, month and year of publication in the case of periodicals, and publisher and place and year of publication in the case of books. Illustrations must be clear photographs. Glossy prints are preferred. Drawings must be made in black ink on heavy paper or cardboard. Any illustrations should bear the author's name and be numbered in the order in which they are referred to in the text. Illustrations must not be pasted on the manuscript. Legends should be placed on a separate sheet. Tables are not illustrations and should be numbered separately.

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ANNOUNCEMENT CONCERNING OFFICE ASSISTANTS

DOCTOR, please direct the attention of your office assistants to this announcement.

The N.A.C. House of Delegates in August, 1946, approved the creation of a national organization of assistants, and in compliance with the directive of the delegates, you are requested to suggest to your office assistants that they forward the following information to the Executive Secretary of the N.A.C.:

1. Name of Assistant.
2. Address, City, State.
3. Length of time served as an assistant
4. Name of doctor employed by

Following the compilation of this essential data, further announcements concerning the association of assistants will be made. In the program designed to elevate the professional status of assistants, training courses and other benefits will be provided.

Communications should be sent to: Dr. William J. Stickel, Executive Secretary, National Association of Chiropodists, 3500 14th Street, N. W., Washington 10, D. C..

Dr. George Pelletier, Chairman
Committee on Chiropodical Assistants

ABSTRACTS

MARCH FRACTURE

HULLINGER AND TYLER observed at Camp Wheeler 300 patients with 313 march fractures. Each patient showed either a fracture line or callus formation by x-ray examination. An additional large number of patients were seen who had many of the earlier signs of march fracture but never positive x-ray signs. There were about 450 patients in this group. The incidence of march fractures at this camp greatly increased beginning in March 1942, as a result of a training order issued in February, which stated that all trainees would carry rifles and full packs at all times during the training program, that the men would march by foot from one area to another instead of riding, and that they would move to adjacent areas frequently on the double time. This increased the admission to the hospital for march fractures to a peak of 66 for the month of May. On May 24 a memorandum was issued lessening the strenuousness of the training program, with the result that the number of cases fell off in June to 44 and in July to 17. While this type of fracture has been reported as occurring in the tibia, fibula, femur, calcaneus, pelvis and cuneiform, it is most frequently found in the second and third metatarsal bones. Prior civilian occupation may be a mild contributory factor in causing early fatigue. The weight of patients and their age do not seem to be contributory. The mechanism of fracture and healing would seem to be as follows: Because of the repeated minimal trauma, there is an incomplete fracture of a few of the bony trabeculations of the shaft, which is most often not visible on x-ray examination. This is followed by hemorrhage, which, being on the surface, produces an elevation of the

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periosteum. New bone is formed in the hematoma. Calcium deposits are seen in this area at an early date. If the trauma continues there is fracture of additional bone trabeculations and additional hemorrhage, further elevating the periosteum and giving rise to additional osteogenesis. There is then slight absorption of calcium at the fracture ends with the dihiscence becoming visible by x-ray examination. If the trauma ceases, the fracture proceeds to orderly healing with complete repair. Treatment should be complete immobilization to prevent motion at the fracture site. Complications are very few in cases treated by complete immobilization.

Bull. U. S. Army Med Dept.—Sept, 1944, C. W. Hullinger and W. L. Tyler.

PATHOLOGY OF HUMAN IMMERSION FOOT

Blackwood reports observations on 14 specimens of immersion foot studied at the Department of Pathology of the University of Edinburgh. The specimens varied in type from a digital nerve to a whole foot and leg, and they have varied also in the interval which has elapsed between the period of exposure and the removal of the specimen. All the material has come from severe cases with the result that gangrene and bacterial infection have often been present. The large arteries showed no severe narrowing. Slight intimal and medial fibrosis was sometimes present, also edema. The smaller arteries showed narrowing only immediately proximal to chronic infection. No significant changes were seen in the capillaries, but there were pericapillary foci of chronic inflammatory cells in the cases complicated at some time by infection and/or gangrene. Fibrous narrowing of small veins, with evidence of old hemorrhage into and around their walls, was seen either near gangrenous extremities, in chronically infected leg stumps or near an old amputation. The large veins showed significant narrowing due to patchy recanalized thrombus only when the leg stumps were chronically infected. Stasis of blood on the venous side, with diapedesis, thrombosis and intimal fibrosis, did occur, but such changes were restricted to areas close to gangrenous or chronically inflamed extremities. Involvement of muscle fibers increased peripherally. From four months onward the muscle picture was one of variation in fiber caliber, with relatively little fibrosis. These changes were indistinguishable from those due to denervation and were associated with degeneration of muscle nerves. In addition there were occasional small areas of replacement of peripheral muscle fibers by fibrous tissue. At twelve months there was evidence of reinnervation of proximally situated muscles in the lower limbs. At twenty-six months after exposure, restoration to normal had spread farther down the limb, but changes indistinguishable from prolonged denervation were still present. In all patients surviving exposure, some degree of nerve degeneration was present. In uninfected patients when bone was available for study there was new bone formation subperiosteally and around the haversian canals. This was evidence of repair of the initial osteoporosis, which is a clinical feature of early survivors. The microscopic studies on patients with immersion foot demonstrates that damage is done to all tissues of the extremity.

Brit. J. Surg. April, 1944—W. Blackwood.

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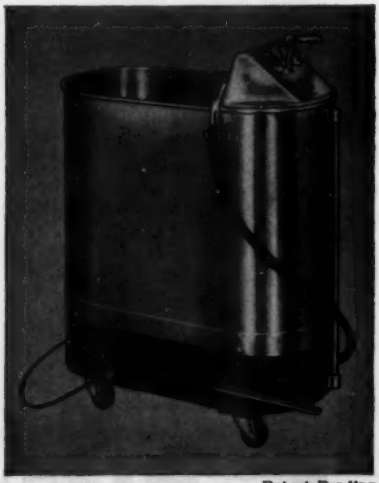

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THE COPPER IONIZATION TREATMENT OF FUNGOUS INFECTIONS

PATIENTS with moderate to severe involvement of the feet and/or hands were treated. The types of infection handled were two: the common interdigital, with and without extension and the dyshydrotic or thick-walled blister types. Cases with secondary infection are not included. All but two cases were managed as outpatients.

No reactions ascribable to copper sensitivity were encountered. Several patients initially developed transient follicular rashes at the points of application of the indifferent electrodes, but these in no case persisted or recurred.

The experience of the author indicates that the copper ionization bath is a safe and valuable method of treatment of fungous infection of the types described. An appreciable number of cases showed persistent scaling or fissuring of the skin despite disappearance of all acute signs. These required the supplementary use of keratolytic agents to complete the healing process. The method possesses certain advantages over the usual forms of therapy. Chronic cases are generally benefitted. The procedure is simple and uniform in its application. The apparatus necessary is easily constructed from scrap material and requires little servicing.

William J. Lahey, and James E. Byrnes. U. S. Nav. M. Bull., April, 1946.

SURGICAL TREATMENT OF INTRACTABLE PLANTAR WARTS

THE MAJORITY of plantar warts are successfully eradicated by conservative measures such as escharotic solutions, electro-dessication, or irradiation in the form of roentgenotherapy. Comparable results are obtained by each of the above methods, 60 per cent to 90 per cent cures. Escharotics are reserved for the simple cases and electrodessication and irradiation are employed when local application of these substances fails. If a single method is desired, the selection would undoubtedly be roentgenotherapy, for this treatment is painless, short, successful and safe, provided the treatment is administered with the due respect to the tolerance dose.

It is recognized, however, that no matter how skillfully used, these methods fail in at least 10 per cent of cases. These intractable problems are not only distressing but often calamitous to the patient. After many years of therapy extremely painful ulceration on the plantar surface of the foot may still persist.

For this type of plantar wart the only resource is removal of the wart area in its entirety and while this in itself presents no difficulty, the restoration of the operative site to a painless weight-bearing area involves surgical problems.

J. A. Dickson, Cleveland Clin. Quart., April, 1946.

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SARCOMA OF A METATARSAL CURED

Dr. Henry W. Meyerding of the Mayo Clinic reported in the J.A.M.A., January 22, 1944, on a thirteen-year cure of sarcoma of a metatarsal bone which was later complicated by multiple fractures of the other metatarsals in the same foot.

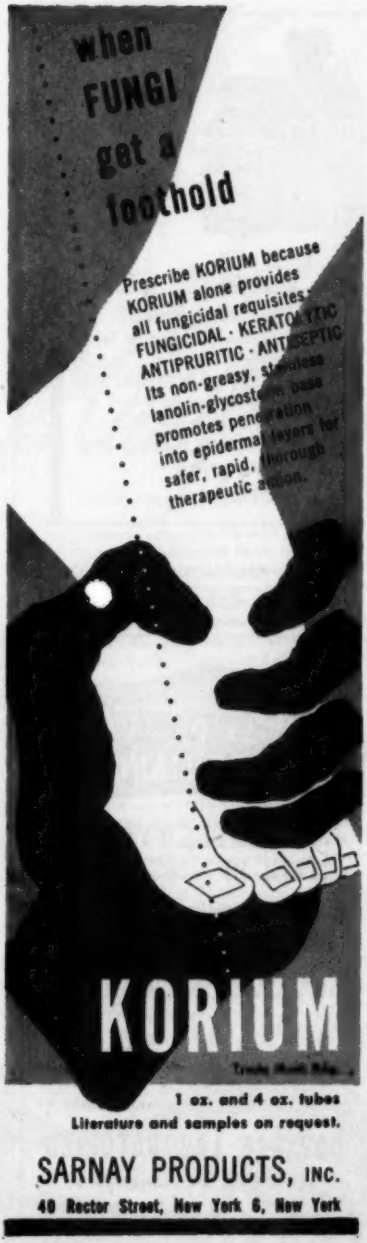
The patient, a 15-year-old boy when first seen, is now a 190-pound man in perfect health. He is able to walk miles without any trouble and to do a full day's work in a shingle mill where he carries heavy blocks of wood all during the working hours.

The trouble started, Dr. Meyerding believes, with a broken metatarsal bone resulting from an accident in which a horse fell on the patient's right foot. The foot was crushed and held by a steel riding stirrup.

The foot swelled "like a watermelon" and for three weeks he was unable to walk on it. It did not feel right for two months after the injury. About two years later, while running he felt something "give way" in the foot, and could hardly walk because of the severe pain. The physician he consulted took an X-ray picture and made a diagnosis of sarcoma of the metatarsal bone.

When he came to the Mayo Clinic it was thought the condition was either inflammation of the membrane covering the bone, a disease characterized by thickening of the bone, or cancer transferred from a tumor in the nose which had been removed some years before.

The patient's mother demanded an operation because of the home physician's diagnosis of sarcoma. The hard, spindle-shaped bony mass that was removed proved to be a bone cancer. The patient was



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given two X-ray treatments after the operation and 35 injections of Coley's toxins during the next few months.

Some months later he stepped on the operated foot with the other foot. X-ray pictures showed no recurrence of the sarcoma but what looked like another tumor of the next metatarsal bone. This bone was removed but the pathologist's examination showed that instead of another sarcoma, as had been expected, the trouble had been inflammation of the bone and an old fracture with callus.

The patient recovered and gained weight and continued to feel well. X-rays, taken to check on his condition, nine months later showed inflammation with apparent fractures of two more metatarsal bones. These later healed. An attack of athlete's foot was treated and a hammer toe corrected by surgical operation, since which time the patient has had no further trouble with his foot or leg and no recurrence of the sarcoma.

POSTURE

No attempt can be made here to embark on the wide subject of correction, i.e., of remedial treatment. It must suffice to draw attention to a few salient points. The primary site of disturbance must be ascertained. "Round shoulders" as a rule consist mainly in an undue flexion in the upper part of the thoracic spine. Again, the constant adoption of some posture may lead to changes in the degree of passive insufficiency in muscles; thus the use of high heels leads to an increase of the passive insufficiency of the gastrocnemius muscles and this may in turn produce strain on the arches of the foot if the high heels are suddenly discarded. If the shoulders are allowed to fall forward the pectoralis muscle shortens and if at-

tempts are then made to assume a "good" posture without correcting this secondary defect there will be a development of an unusual posture elsewhere, e. g., a lordosis or even a pronation of the foot. If a subject with a long curved back tries to straighten himself without guidance he will bring his head up by a forward displacement of the pelvis and a backward sway above the pelvis. Thus an important problem in the correction of postural deviations consists in avoiding the development of still other postural disturbances.

It must be emphasized that the general and detailed forms of the body are highly individual features which render it impossible for all persons to assume identical attitudes. There is, further, good reason to believe that an attempt to approximate to a single standard correct pattern of posture is undesirable from the aspect of functional efficiency. As Medea said of the search for the Golden Fleece, "the Golden Fleece may not be so valuable as you have thought." The search for the one correct and perfect posture may be even more difficult than that for the Golden Fleece. It can be stated, however, that certain postural variants are known to be caused by abnormal conditions in the body or by abnormal habits of life; and again, certain postural variants tend to the production of disabilities of various kinds. These can be ascertained, and further investigation should permit the determination of what is a "fault" in posture, and what are the limits within which a posture may correctly be termed "good."

A. B. Appleton,
Practitioner 156:55
(Jan.) 1946

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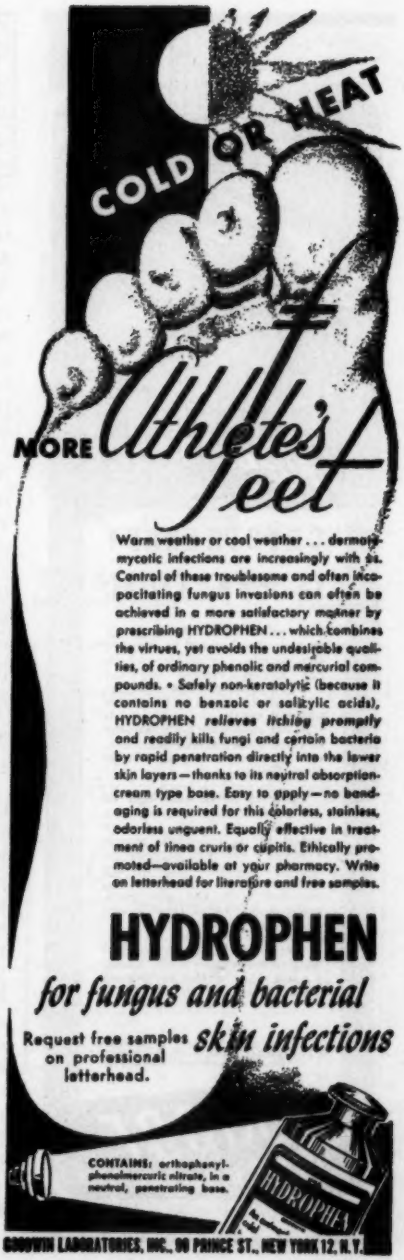
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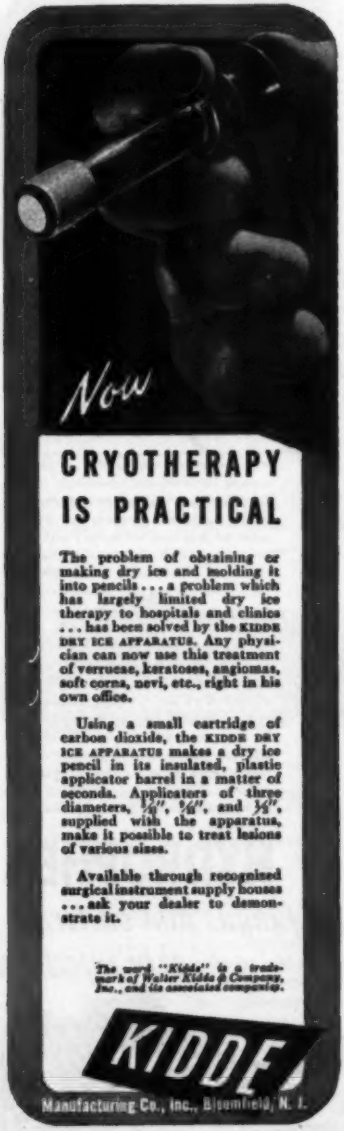
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REFERENCE DIGEST

A condensation of articles relating to the lower extremities.

DR. ROBERT B. RAKOW
Brooklyn, N. Y.

Topical Use of Penicillin in Treatment of Pyoderma; Major B. J. Hoffman, M.C., A.U.S.: Archives of Dermatology and Syphilology, May, 1947.

The treatment of purulent cutaneous infections is a common procedure. With the advent of the sulfonamides and the antibiotics progress has been made in the control of pyoderma.

Over a nine-month period in an Army hospital, the author has been in a position to compare and evaluate the clinical results when using a 5% sulfathiazole ointment, penicillin ointment, and penicillin wet dressings in the treatment of pyoderma as the result of various factors. The concentration of the penicillin ointment was 800 units per gram in a water soluble base. The penicillin solution contained 800 units per cubic centimeter of isotonic saline.

The ointments were applied to the affected area as a fixed dressing. The wet dressing of penicillin was applied to gauze and the part enveloped in a Bunyan bag to prevent evaporation. The dressing was changed every 24 hours. The results obtained with the use of the penicillin wet dressings were markedly superior to both ointments. The penicillin ointment was more effective than the sulfathiazole ointment.

A contact dermatitis following the use of the penicillin wet dressings was noted in approximately 40% of the cases. This complication occurred usually after the fourth day of therapy.

The dermatitis was minimized

by discontinuing the wet dressings after the fourth day for twenty-four hours.

Hoffman feels that the disadvantages in the use of ointments supersede their advantages in the treatment of pyogenic infections. They, therefore, should be discarded in favor of wet dressings, preferably penicillin.

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ORGANIZATION NEWS

COLORADO

THE regular quarterly meeting of the Colorado Association of Chiropodists was held July 13, 1947, in the Oxford Hotel, Denver. Dr. Harry L. Halton demonstrated plaster casting technique for the Whitman brace and other inlays. A round-table discussion of the new law which the Colorado Assembly passed was held. The following officers of the Association were present: Drs. George Helbig, George Patton, Norman Tripp, and Robert G. Gruber.

OREGON

THE Oregon State Association of Chiropodists announces that it will conduct a two-day postgraduate course at the Heathman Hotel, Portland, Ore., September 27-28, 1947. Dr. Thomas Nichols of Chicago, Ill., will present the two-day session.

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OKLAHOMA

At a recent meeting of the Oklahoma Chiropody Association, the following officers were elected: President, Dr. W. J. Petty, Tulsa; Vice President, Dr. G. H. Darr, Bartlesville; Vice President, Dr. F. J. Miller, Muskogee; Secretary, Dr. A. D. Conley, Jr., Tulsa; Treasurer, Dr. F. E. Trippet, Tulsa.

Elected members of the Board of Governors are: Drs. M. H. Gennis, Tulsa; C. E. Everly, Okla. City; L. V. Shelton, Tulsa; R. E. Owens, Okla. City; R. C. Gibson, Okla. City.

The Oklahoma Association is making preparations for the Southwestern Chiropody Congress which will be held in Oklahoma City in 1948. The dates will be announced later. Arrangements are being made to conduct a scientific meeting October 19-20, 1947. Representatives to the N.A.C. convention are: Dr. H. H. Johnson, Enid, Delegate, and Dr. S. D. Tomlinson, Oklahoma City, Alternate.

TEXAS

The Tarrant County Chiropody Association of Texas recently decided to conduct a series of annual foot examinations for all of the elementary school children in Fort Worth. The advantages and disadvantages of the various methods used in child foot health surveys were considered.

PENNSYLVANIA

The Lehigh Valley Chiropody Society held a regular meeting at the Sun Inn Hotel, Bethlehem, Pa., on July 20, 1947. Dr. J. R. Dougherty presided.

The Society adopted a resolution favoring the N.A.C. group insurance.

Dr. H. Hunsicker was appointed delegate to the state convention which will be held in Pittsburgh.

WEEKLY X-RAY CONFERENCES BEGUN AT F.I.O.P.

WEEKLY conferences in X-ray and roentgenological interpretations have recently been inaugurated in The Foot Clinics of New York in cooperation with The First Institute of Podiatry, Long Island University.

The X-Ray department of The Foot Clinics of New York is under the immediate supervision of Joel William Feldman, M. D., who is also Professor of Roentgenology at F.I.O.P. He is assisted by Drs. M. M. Ringel and Sandor Silver.

Conferences have been scheduled for Wednesday evenings between the hours of seven and nine P.M. It is hoped that these discussion groups will serve as a refresher course for all podiatrists-chiropodists. A major phase of the instruction will be to keep practitioners abreast of technical developments in chiropodical x-ray.

All podiatrists-chiropodists are welcome to attend these forums, gratis, and to bring interesting films for diagnosis and discussion. Diseases of the foot and leg will be discussed from the x-ray point of view. Technic and processing of films will also be demonstrated. Practitioners visiting New York will be welcomed to these sessions.

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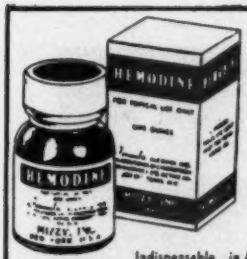

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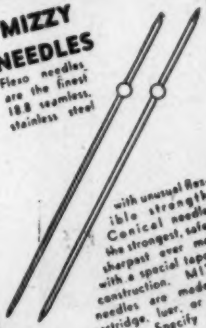

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